

REVISION OF
THE FLORA OF THE BOMBAY PRESIDENCY.

BY

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PART XVIII

(With 4 plates and 1 text-figure.)

(Continued from page 495 of this volume).

ORCHIDACEÆ

BY

E. BLATTER, S. J., Ph.D., F.L.S. & C. McCANN, F.L.S.

28. SACCOLABIUM Blume (not in Cooke).

Epiphytic herbs; stems leafy. Leaves long, linear, sometimes terete. Flowers solitary or in simple or branched, few- to many-flowered racemes, small or moderate sized. Sepals and petals free, spreading, recurved or incurved. Lip spurred, 3-lobed, rarely entire, side lobes short, erect, midlobe fleshy, spur saccate, naked within, or with calli on the front wall only. Column short and broad; foot 0 or indistinct. Anther 1- or imperfectly 2-celled; pollinia 2, entire or 2-partite.

Species a few.—Indo-Malayan.

Saccolabium flabelliforme *sp. nov.* Blatter & McCann.

[*Affinis Saccolabio pulchello* Fischer a quo tamen differt foliis latioribus acutis minime bilobis, floribus multo maioribus, sepalis petalisque flabelliformiter dispositis labio albo ad basim angulo profundo triangulari flavo ornato, lobis labii lateralibus nullis.]

Description: A small plant; stem very short, arising from beneath the leaves; roots very long, flattened, bluish grey, clinging to branches of trees. Leaves linear or linear-oblong, acute, flat, up to 12 cm. long and about 2-3 cm. broad. Flowers sessile (i.e. ovary not stalked) in few- (usually 6-) flowered racemes, 18 mm. wide by 12 mm. across; bracts broadly ovate, 1 mm. long 2 mm. broad at base, thin, brown. Dorsal and lateral sepals and petals arranged like a fan; sepals and petals apple-green, sometimes with a rose-coloured dot; dorsal sepal oblong-obovate, slightly emarginate and apiculate, 9 by 4 mm.; lateral sepals spatulate-oblong, obtuse, slightly concave, 8 by 3 mm. Petals resembling the lateral sepals, but slightly smaller, slightly concave, 7 by 2.7 mm. Lip without side lobes, 3 mm. long, 8 mm. broad, curved at its extremity with the straight hinder margin as a base (the hinder margin being made up by the straight front edge of the opening of the spur and a short free portion on each side set onto the outside walls of the spur slightly below its edge), slightly deflexed, outer edge minutely fimbriate, tip emarginate, pure white, except the thickening of the spur which is greenish; there is a central deep yellow triangle on base of lip, and the bottom of the spur is similarly coloured, the yellow triangle of lip is bordered with rose-coloured dots and short lines. Spur nearly hemispherical, slightly laterally compressed, with a longitudinal, outwardly convex, inwardly concave thickening, length and side diameter 5 mm., the free lateral edges of the spur slightly ascending outwardly from base to column, the free edge of the spur-cavity marked thinly with purple-rose, and the interior bottom of spur dotted with similar coloured spots. Column white, generally strongly suffused with deep rose, without foot, as broad at base (2 mm.) as the front edge of spur where the lip commences, and about as high as it is broad there, triangular in shape seen from the front, the apex rather broadly rounded, the cap oval, pointed in front, convex with depressed margins, yellow, anticous or inclined (it forms the top of



Del. C. McCann after Miss E. Bell.

Saccolabium flabelliforme Blatter and McCann, sp. nov.

the column), slanting down towards opening of spur. Pollinia 2, orange-yellow, oval, attached to a caudicle as long as the diameter of both together; gland oval, with a bifid tip which is always visible outside the cap lying on the rostellum and which hides completely the stigmatic hollow. The front-opening leading to the stigmatic hollow triangular owing to the flanged front-walls of the column. Ovary in flower 8 mm. long.

Locality: *N. Kanara*: Devimane Ghat (Sedgwick & Bell 6957! type); Yellapur (T. R. Bell, from sketches, coloured plates and MS. notes); Sirsi, in evergreen (Sedgwick 7078!); in forests (T. R. Bell 5424! 5413!).

Flowers: September 1915 (Yellapur); October 1914 (Sirsi).

29. *NERVILIA* Comm. ex Gaud.

(Under *Pogonia* in Cke. II, 706).

Terrestrial, tuberous, 1-leaved. Leaf mostly appearing after the flowers, broadly cordate to orbicular, plicate. Flowers solitary or few to many, racemose. Sepals and petals subequal, narrow. Lip inferior, adnate to the base of the column, sessile or almost clawed, entire, 2-fid or 3-lobed, sometimes slightly saccate at the base. Column elongate, broadening upwards; foot 0. Anther substipitate; pollinia 2, 2-fid, or 4, powdery; caudicle and gland absent. (ex Fischer).

Species 45.—Tropics of the Old World.

The Bombay species have been put under *Pogonia* Juss. by Cooke. *Pogonia*, with its 40 species is, 2 Chinese-Japanese species excepted, a New World genus.

Cooke mentions 2 species from the Presidency which when put under *Nervilia* have to be called *N. plicata* Schlechter and *N. carinata* Schlechter. To these we add 3 species not known from the Presidency before and 4 new ones.

Hook. f. in his F. B. I. vi, 119 refers to the difficulty he experienced in analysing the species from Herbarium specimens and adds that 'all require revision.'

We have had the advantage of exceptionally well-prepared specimens of leaves and flowers of several species and, in addition, excellent drawings and paintings by Miss E. Bell. Besides, Mr. T. R. Bell was kind enough to put at our disposal his detailed descriptions which he had drawn up from live specimens.

We feel confident, though we are not absolutely sure, that the new species are all good ones. Hooker's descriptions are rather meagre and Wight's illustrations are not always perfect. But taking it for granted that the details given by Hooker are correct, we are allowed to say that the species described below are good. If, however, one or the other is not and if other botanists should think that they should be combined with one of the older ones, our descriptions will at least serve the purpose of furnishing many details which were not known before.

As to the time of appearance of the leaf Hooker f. states (and Schlechter and Fischer agree with him) that all the species of the genus *Nervilia* leaf after flowering. This is not always the case.

I. Scape 1-flowered

- | | | | |
|--|-----|-----|-------------------------------|
| 1. Sepals and petals greenish white, sometimes with a rosy shade. Lip broadly saccate, pinkish white | ... | ... | 1. <i>N. monantha</i> . |
| 2. Sepals and petals light maroon-green on back, dirty green inside. Lip very slightly saccate at base; tube light apple-green, midlobe white suffused with rose | ... | ... | 2. <i>N. infundibulifolia</i> |
| 3. Sepals and petals greenish purple. Midlobe of lip obovate, pink, mottled with purple... | ... | ... | 3. <i>N. Hallbergii</i> . |
| 4. Sepals and petals green. Midlobe of lip rhombic-lanceolate-acuminate from a narrow hairy base; disk white mottled with pink | ... | ... | 4. <i>N. juliana</i> . |

II. Scape 2-flowered. Flowers 30–35 mm. diam.

- | | | | |
|---------------|-----|-----|------------------------|
| Lip pale pink | ... | ... | 5. <i>N. biflora</i> . |
|---------------|-----|-----|------------------------|

- III. Scape 2-3-flowered. Lip lilac with a green spot at the base and a yellow line along the thickened part of the midrib 6. *N. plicata*.
- IV. Scape several-flowered. Flowers 14 mm. long, green, except for lilac markings on lip ... 7. *N. hispida*.
- V. Scape many-flowered
1. Leaf 13- or more-ribbed 8. *N. Aragoana*.
2. Leaf 7-9-ribbed 9. *N. carinata*.

1. *Nervilia monantha* sp. nov. Blatter & McCann.

[*Orchidacea appropinquans Nervilium julianam* Schlechter a qua distingui potest folio generatim largiore, sessili vel subsessili, obtuso, multinervoso (11-19), flore multo minore, sepalis petalisque linearibus albo-viridibus roseo-nervis labii forma distincta colore roseo-albo. Differt a *N. plicata* Schlechter folio viridi, flore unico, colore et forma labii; a *N. biflora* Schlechter flore semper unico, labio minime glabro, columna distincta.]

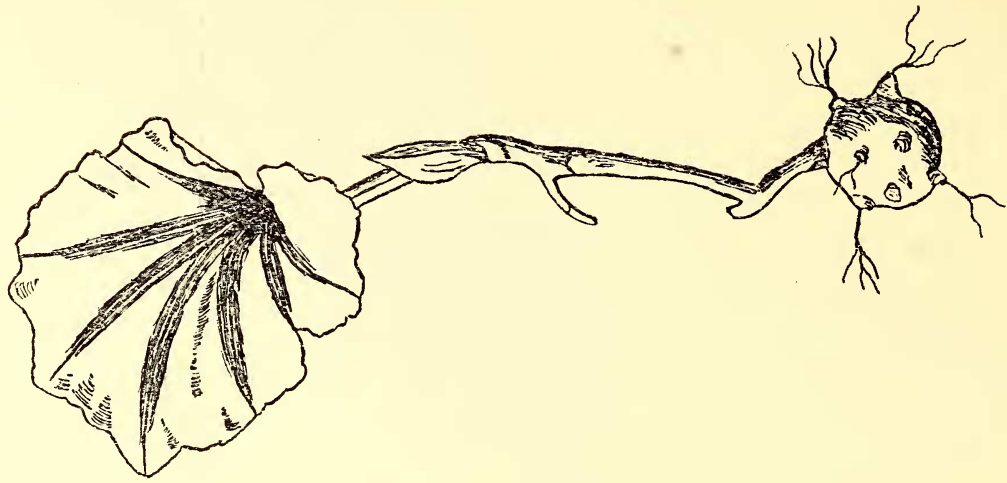
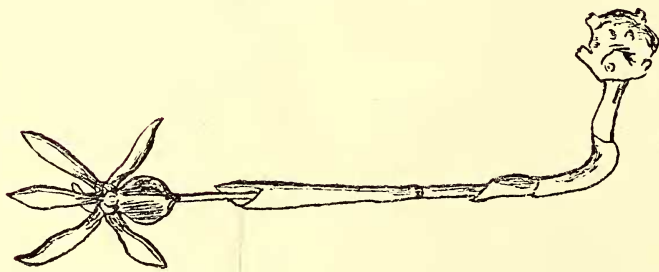
Description: Tuber subglobose, 25 by 15 mm. or less, depressed above and below, giving off sparse little roots from surface all over, yellowish white, generally 5-10 cm. underground. Two or three stolons from stem between tuber and origin of leaf. Leaf sessile or subsessile, lying flat on the ground and appearing after the flowers, orbicular-cordate, obtuse, with a broad or narrow sinus at base, 11-19-nerved, the size varying between 2 and 10 cm. diam., pure green throughout, upper surface velvety when first expanded, with short fine glandular white hairs, glabrous below. Flowering-stem 7-10 cm. long, fruiting-stem reaching 15-20 cm., very slender, always 1-flowered, light pink, with usually 2 long, wide-mouthed acuminate sheaths, these shorter than the internodes, lighter pink with 7 purplish nerves. Floral bract triangular, subulate, short, not concave, longer than broad, generally 1-1.5 mm. in length, whitish with a green shade, edges reddish. Flowers erect or suberect. Sepals and petals similar to each other in shape and colour, linear-acute, slightly narrower at base than in the middle, greenish white, sometimes with a rosy shade, the nerves rose-coloured. Sepals 5-nerved, 17 by 3 mm., concave, the midvein not particularly prominent on back. Petals hardly shorter, 3 mm. broad, 3-nerved. Lip hardly saccate, 18 mm. long, the lower $\frac{3}{4}$ tubular, 4 mm. broad in middle, about 2 mm. at base, pinkish white, hiding the column, the edges hardly conniving, widening from base upwards, the lower part afterwards produced into a short deflexed terminal lobe which is very wrinkled both round the margin as well as longitudinally in the limb with the margin shortly fimbriate, separated by a deeper cut from a broadish, fimbriate (not always), smaller, 2 mm. long lobe on each side forming the end of the tubular part of the lip, the throat of the tube stretching some way up each side lobe and some way down the tube beset with white soft hairs; lip 7-nerved with other veins outside the exterior ones, the 3 central nerves with a row of purple-pink tubular outgrowths which are simple at the beginning and become longer and branched towards the distal end; the nerves themselves purplish rose, the central nerve light brownish. Column glabrous, stalk quite straight, the anther leaning slightly forward; stalk thickened to contain the stigma which is semi-elliptical, longer than broad, somewhat pointed below, straight at top below anther; edges of anther fairly prominent, the back convex, very slightly keeled down middle, the cap tilted forward a good deal, reaching far above the edges, rather square in form, though longer than broad, sometimes broader across top than at front, depressed down centre at top; the anther-pockets occupying the whole of the bottom which is here at right angles to the front face; the pollinia attached behind, or rather lying with their bases towards the back, these bases dark purple and globular, the pollina yellow; the pockets are parallel and straight. Length of column 9 mm.; breadth of stalk nearly 1 mm.; breadth of anther a little less than 2 mm., the part of top of column containing the stigma 2 mm. Fruit spindle-shaped with 6 longitudinal ridges; these ridges broad, prominent and rounded in transverse section, 21 mm. by 7 mm., the beak 8 mm., thick and conical, with the withered lip showing as an extra thin point beyond; it is pure green in colour as is also the beak, generally deflexed.

The leaf appears above ground as a thick, short, spindle-shaped bud, covered by a sheath, 25 by 8 mm., pointed. (Chiefly from T. R. Bell's MS. notes drawn up from live specimens).



Del. C. McCann after T. R. Bell and Miss E. Bell.

Nerrilia monantha Blatter and McCann, sp. nov.



Del. C. McCann after Miss E. Bell.

Nereila infundibulifolia Blatter and McCann, sp. nov.

Locality: *N. Kanara*: Yellapur (T. R. Bell 5428! type, 5428a! 5429 5434! 2522-2524!); Nagargali (Sedgwick 2635!); Karwar (T. R. Bell 4071!).— Bell found this species very common in 1911 at the beginning of June after rain round Yellapur in jungle, preferring apparently bamboo jungle where the ground is covered with dead leaves. He found it also in the compound of the D. F. O. bungalow under *Pithecolobium* trees. It is always found under shade and generally comes up in groups.

Flowers: June 1911 (Yellapur).

2. *Nervilia infundibulifolia* sp. nov. Blatter & McCann.

[*Orchidacea similis aliquomodo Nerviliae monanthae* Blatter & McCann, *sed facile distinguitur folio infundibuliformi, paucinervoso* (5-7-9) *petiolato, sepalis 3-nervosis, petalis 1-nervosis, labii lobo medio integro pollinibus albis.*]

Description: Tuber about 12 mm. in height, slightly flattened above and below yellowish white, buried 3-8 cm. underground, covered sparsely with little root-knobs. The stolons, if any, arise not from the tuber but from the stem below the origin of the leaf. Leaf-bud spindle-shaped, 15 by 3 mm., pointed. Leaf solitary, appearing after ripening of fruit, broadly cordate, funnel-shaped, about 3-4 cm. diam., margin crimped, irregularly and minutely dentate-crenulate, 5-7- or rarely 9-nerved, the last pair generally thin, green with broad deep purple-maroon streaks from base along the depressed nerves, broadening towards the middle, narrowing again towards extremity but not reaching the margin, the margin very finely finely brown-maroon. Petiole dark brown-maroon, embraced at base by a 5-nerved, membranous, oblong-acuminate sheath which is light brownish and has the nerves purplish, the petiole has as many prominent ridges as the limb has nerves and the ridges are continuous with them. Flowering-stem 7-11 cm. high, straight, consisting of 2 internodes; upper sheath of scape about 3 cm. long, linear-oblancoolate, acute, wide-mouthed, 5-nerved, with an extra marginal one; lower stem-sheath much shorter than the upper, stem and sheath maroon-coloured. Flower 1, generally at a right angle to the axis or slightly inclined. Floral bract generally 3 mm. long, but may reach even 7 mm., about 2 mm. in width, 3-nerved, acute or acuminate, concave, maroon-coloured, the veins darker. Sepals and petals similar, linear-oblancoolate, acute, slightly concave, light maroon-green on the back, dirty green inside, the nerves maroon-red. Sepals 3-nerved, 13 mm. in length, 3 mm. broad where broadest. Petals 1-nerved, 12 mm. in length, 2 mm. broad where broadest. Ovary lowly 6-keeled, each more prominent central keel being flanked on each side by a much lower one, maroon-red. Lip very slightly saccate at base, tubular for half its length or slightly less, narrowest just above sac, thence increasing forwards, the edges hardly connivent, parting to show anther slightly, ending on each side in a triangular, rather blunt lobe which overreach in length the column and anther, produced below into the midlobe which is in the same plane as tube, broadly ovate, the margin nearly entire (shows signs of unevenness), the lateral margins deflexed, the extremity rounded, the midvein somewhat broadly gibbous, especially towards the end, though not very prominent (roundly convex in transverse section), beneath channelled along midvein, deeply and narrowly so just before extremity. Length of lip 17 mm., breadth just above sac 2 mm. (less across for the tube is higher than broad), at mouth 3 mm.; the side lobes very slightly spreading, about 15 mm.; long, equilaterally triangular; the midlobe 10 by 7 mm.; the ovary about 4 mm., the pedicel 2 mm. Colour of lip light apple-green for the tube, the side lobes lighter, the midlobe white suffused all over with rose (with a maroon shade in it, medium light in shade) in irregular lighter and darker patches or spots, the midvein for $\frac{2}{3}$ of its length and the margins narrowly white. Column straight, the anther, and (stigma, i.e., the enlarged top half) leaning back, the stalk half the total length, flat in front, rounded behind, covered with short, soft, white hairs for half its length below the stigma on its flat front surface; stigmatic cavity large, occupying nearly half the length of the whole, oval, longer than broad and slightly narrower below than above; the cap occupying the whole top of column, horizontal, the edges of the anther (top of column) only very slightly embracing it, this cap being square when seen from above, concave transversely, straight along front edge above stigma, higher behind than in front; the pockets beneath straight, parallel, containing each one pollinium, lamellated, shaped like a broad sign of exclamation. Column about 8 mm., the breadth of stalk 1 mm., of anther 2 mm.; the cap hides the whole top of column. Colour

of column light apple-green, of anther whitish, the cap just touched with maroon along its front edge; there are sometimes a few fine longitudinal red streaks on stalk and back of anther; the pollen masses are white. Fruit 6-ribbed, the ribs wide with a more prominent central ridge, beaked with the persistent floral envelope, the column, petals and sepals closely embracing it, the withered end of lip generally protruding as a point from the tip of the beak (the sepals and petals close round the column) completely forming an end cone pointed at extremity. Capsule 11 by 5.5 mm., oblong-oval, the beak another 15 mm. (Chiefly from T. R. Bell's M.S. notes and paintings by Miss E. Bell.)

Locality: N. Kanara: Yellapur (T. R. Bell).—Usually found in places where there is a covering of dead leaves.

Flowers: June 1911.

3. *Nervilia Hallbergii* sp. nov. : Blatter & McCann.

[*Orchidacea referens Nervilium julianam a qua differt labii lobis lateralibus integris, lobo medio obovato et basi minime pubescenti necnon colore.*]

Description: Tuber globose, warty. Leaf not seen. Flowering-stem about 10 cm. high, 1-flowered, consisting of 2 internodes, each with a long linear-acuminate sheath, the upper larger. Flower nodding, bract minute. Sepals and petals spreading, subequal, narrowly lanceolate, greenish purple; midlobe of lip obovate, rounded at tip, pink, mottled with purple, provided with a central white, linear callus; lateral lobes falcate, whitish, folded round stalk of column; no sac or spur. Column pink; anther loose in tube. Pollinia not observed.

Locality: W. Ghats: Kuna near Khandala in jungle (Hallberg, photograph and specimen in formaline at St. X. C., Bombay).

Flowers: June 1917.

4. *Nervilia juliana* Schlechter in Engl. Jahrb. xiv (1911) 402.—*Epipactis Juliana* Roxb. Fl. Ind. iii (1832) 453.—*Pogonia juliana* Wall. Cat. 7399; Hook. f. F.B.I. vi, 119; Trim. Fl. Ceyl. iv, 225.

Description: Tubers globose, 12-25 mm. diam., white; stem 5-8 cm., white, erect; roots few, vermiform arising above the tuber; leaf solitary, developing after the flowering of the scape, petioled, broadly ovate-cordate, acute, about 5 cm. diam., membranous, plicate with 5-7 veins, radiating from the top of the petiole, green or purplish beneath; petiole short, with a few acute sheaths at the base; scape 12-15 cm., with several convolute sheaths, the upper longest. Flower solitary, shortly pedicelled, 2.5 cm. broad; bracts shorter than the ovary. Sepals and petals narrowly lanceolate, acuminate, green; lip longer than the sepals, side lobes small, narrow, falcate, oblong, toothed, white, terminal rhombic-lanceolate-acuminate from a narrow hairy base, white, mottled with pink; disk pubescent between the lobes.

Locality: N. Kanara, in forests (Bell 5437!).

Distribution: Assam, Sylhet, Lower Bengal, N. Kanara, Ceylon.

5. *Nervilia biflora* Schlechter in Engl. Jahrb. xiv (1911) 403; Fischer Fl. Madras pt. viii (1928) 1459; Hook. Ic. Pl.—*Pogonia biflora* Wight Ic. t. 1758; Hook. f. F.B.I. vi, 119.

Nervilia biflora is very incompletely known. Apparently it has been found only once, in the Wynad jungles of the Madras Presidency. The leaf is not known at all, and as to the floral details we have practically only Wight's illustration. We take our specimens from N. Kanara to be this species. They agree in nearly all details with Wight's and Hooker f.'s diagnosis, except where Hooker f. says that the midlobe is crisped and that the sepals and petals are white. Our sepals and petals are light brownish-yellowish with a green shade.

In the meantime Mr. C. E. C. Fischer of Kew Gardens has been kind enough to compare our specimens with the type specimen in the Kew Herbarium. He and Mr. Summerhayes who is in charge of the Orchids of the Herbarium are agreed that our plant is *Nervilia biflora*. A description with drawings has been published in the Ic. Plant. As this work is accessible to few only, we repeat the description in this place.

Description: A stout terrestrial plant. Tuber white with sparse little rootlet-knobs, globose, 17 by 15 mm.; portion of stem between tuber and base of leaf-stalk very short, about 3-4 cm. Leaf ovate-cordate, acute or acuminate, plicate, many-nerved, spread on the ground, shortly stalked or almost without

stalk, brown-maroon, hairy all over on the upper surface, about 8 cm. long and 6 cm. broad. Flowering stem growing from the sinus of the leaf which lies flat on the ground, 8-10 cm. long, lengthening after flowering to 15-23 cm., greenish white below, and where it is covered by sheaths, becoming, together with ovary, brown-maroon with a green shade towards top; sheaths 2 in number, corresponding to the internodes, about the length of the internodes, linear-obovate-acuminate, 9-veined, soiled greenish white with a brownish shade, the veins darker greenish; internodes ribbed. Flowers 2, one above the other, 30-35 mm. diam. Floral bracts variable in size, 3-6 mm. long, slightly concave, more or less equilateral-triangular, usually entire, sometimes with small teeth at apex, showing signs of longitudinal veins, colour of sheaths. Sepals and petals spreading, similar, narrowly oblanceolate-acute or acuminate, light brownish-yellowish with a green shade. Sepals 27 mm. by 4 mm., somewhat concave, midrib prominent on back, 7-nerved. Petals 23 mm. by 3 mm., 5-nerved, outside nerves sometimes indistinct. Lip slightly saccate at base, tubular for nearly $\frac{2}{3}$ its length, embracing the column completely, narrowest just above basal sac, then gradually widening, the edges closely conniving, pressed against each other forming a keel, then separating gradually and opening wide into the terminal lobe which is really the mouth of the tube widened out obliquely, the contour rounded, very slightly emarginate at end, the margins very shallowly and slightly dentate-crenulate, the midvein prominent and swollen, impressed on the underside leaving the limb inflated on both sides. Length of lip 18 mm., breadth in centre 5 mm., diameter of tube at origin 2 mm. When the lip is flattened out its shape is nearly elliptical with 2 very short insignificant side lobes at about $\frac{2}{3}$ from the base. Colour of lip rose pink, lighter at base and along conniving edges of tubular part, veined darker from midvein outwards, the midvein somewhat broadly white. Column erect, stalked, slightly broader than thick, somewhat concave down front, curved twice, once forward at base, then backwards in upper part. The stalk widens just below anther to contain the concave, transversely elliptical stigmatic surface which occupies about $\frac{1}{4}$ of the stalk-length; the anther above it, about the same width, leaning slightly forwards, straight on its front edge, convex behind with a slight keel down middle, the sides produced upwards slightly higher than the cap which is situated in such a way that this convex part of the column with the keel is visible from above behind it; the cap rather square, convex behind, depressed centrally towards front; pollinia-pockets beneath slightly S-shaped, long, occupying $\frac{2}{3}$ of the length; pollinia lying with their bases forwards, two in each pocket, longly oval, pressed against each other in each pocket, composed of many lamellae; colour of column whitish-rose, the cap rose, red in front, the pollinia-pockets white, pollinia yellow. Length of whole column including anther and cap 10 mm.; breadth of anther 2 mm. No sign of hairs on the column. Fruit spindle-shaped, 6-ribbed, the ribs broad and low, winged along the prominent middle lines, 16 mm. long by 8 mm. broad (across the ribs), the beak of sepals and petals another 18 mm., the withered lip showing as a thin point beyond again.

The leaf appears above ground as a very thin bud, about 17 by 4 mm. and pointed; after thickening rapidly it expands in a very short time.

Very often only one fruit develops on each stem. The plant is gregarious and is nearly always found amongst dead leaves.

Locality: N. Kanara: Yellapur, behind the forest Naka around the root of a tree in jungle, amongst dead leaves (T. R. Bell 6065! 6066! ter); Tatwal, in large dense jungle (T. R. Bell in MS.); Sirsi (T. R. Bell in MS.).

Flowers: May 1912 (Sirsi); May 1919 (Yellapur); July 1910 (Tatwal).

Fruit: July 1911 (Tatwal).

6. *Nervilia plicata* Schlechter in Engl. Jahrb. xiv (1911) 403; Fischer Fl. Madras pt. viii (1928) 1458.—*Pogonia plicata* Lindl. Gen. & Sp. Orchid. (1840); Hook. f. F.B.I. vi, 119; King & Pantl. in Ann. Roy. Bot. Gard. Calc. viii (1898) 268, t. 358; Cke. ii, 707; Prain Beng. Pl. 1025; Brühl Orch. Sikkim (1926) 157.—*Epipactis plicata* Roxb. Fl. Ind. iii (1832) 454.—*Arethusa plicata* Andr. Bot. Reg. t. 321.

Description: Cke. ii, 707.

Locality: Konkan: Malabar Hill in Bombay Island, Millard's garden (Millard 16723! in H. St. X. C.).—*W. Ghats*: Khandala (Cooke!); Lonavla (H. St. X. C. 26510!).

Flowers : June 1892 (Lonavla).

Distribution : Konkan, W. Ghats of Bombay Pres., Madras Pres. : Rampa Hills. 1,500-2,000 ft. Mysore, Travancore, Sikkim, Bengal.

7. *Nervilia hispida* sp. nov. Blatter & McCann.

[*Orchidaceae* vicina *Nervilia Aragoanae* Gaud., necnon *N. carinatae* Lindl. a priore tamen differt folio multo minore et dense hispido pilis minutis albotuberculato, scapo breviori, floribus minus numerosis et cum folio coætanais, labio basi aliquantulum saccato, colore viridi, ab altera tamen petiulis multo longioribus, folio hispido nervisque multis prædito.]

Description : Tuber globose, whitish, covered with sparse rootlet-knobs, 20 mm. broad by 17 mm. high. Leaf appearing at the same time as the flowers, broadly cordate, cuspidate, with a wide rounded sinus, thin in texture, finely hispid because of a dense covering of extremely minute, white, tubercular hairs, giving it a shagreened appearance, 4.5 cm. long by 5.3 cm. broad, 13-15 nerved from base, green, plicate between the nerves, margin entire, wavy, the nerves maroon towards base; petiole 13 cm. long from tuber, 11 cm. above ground, maroon-brown in colour, with a narrow smooth rounded channel down the front, ribbed in continuation of nerves of blade. Scape including raceme 10-11 cm. high, 4.5 mm. thick, round, with many fine longitudinal ribs which are not prominent, green with a maroon tinge, except axis of raceme, several-flowered; raceme about 5 cm. long; internodes of scape 2, the lower slightly shorter, the sheath to upper 25 mm. long, shortly pointed, about 11-nerved, dirty light green with a brown shade. Bracts linear-oblong, acute, concave, 12-23 mm. long by 1.5-3 mm. broad, with about 7 nerves, slightly oblique. Flowers green, except for lilac markings on lip, 14 mm. long; pedicel 3 mm. long, the wing-ridged ovary 3 mm. long. Sepals and petals apple-green, similar in shape, linear-oblancoolate, acute, 3-nerved, all somewhat concave. Sepals 16 by 5 mm.; petals 15 by 5 mm. Lip very slightly saccate at base, tubular for 10 mm., the rest, 4 mm., being the midlobe, semicircular in outline, the apex mucronate owing to prolongation of midrib. The basal tubular portion is 2.5 mm. just above sac, 4 mm. at end where on each side is a short, rounded side lobe, separated from the midlobe by a shallow rounded sinus; side lobes 1 mm. long, triangular-rounded. The midlobe has the margin curled up all round and is thus cupular, has 3 nerves down the middle beginning at base of lip, all 3 prominent beneath, the 2 side ones the more prominent above; outside the side ones are veins running from them to margin of midlobe and tube; all these veins, except the middle length one are set with soft, white fluff. Colour of lip apple-green, the midlobe having the space outside the 3 length-nerves lilac-coloured on the free exposed portion, the little veins from the side length-nerves to margin being also lilac as far as some way up the tube; when not lilac all veins are darker green than the ground colour. Column whitish light green, the cap lighter and gently tinged with rose, the tinge darkest just at front border; it is nearly straight, clavate at top, flat in front, rounded behind, quite smooth throughout except along the keel on the back of the anther where there is a line of small white hairs; stigma shallow, transverse-oval, straight across top below cap and occupying about $\frac{1}{3}$ of the whole column length; side walls of anther thin and produced slightly upwards free of the cap, but not overreaching it and also out in front on each side of stigma; half the thickness of top of column is visible behind the cap; the cap lies inclined forward at 45°, is nearly square, slightly depressed down centre and produced forward at front edge. Length of column 10 mm., breadth 1.5 mm., the stalk being 6 mm. of the total length; anther 2.5 mm. in width; cap about as broad as the stalk, i.e., 1.5 mm., but is, of course much thinner through; anther pockets parallel, pollinia 2 in each pocket, shaped like a sign of exclamation, each pair pressed together, lamellate, very light yellow in colour. Fruit fusiform with 6 ribs along the whole length.

The tuber is generally 7-10 cm. below the surface in open places under trees as often as not, though also where there is a covering of leaves. The leaf and scape start from the same point of tuber. Later stolons arise from the leaf-base underground.

The leaf comes out at the time of flowering. It shows in the beginning as a somewhat thin bud with a sheath 2.5 cm. long; sheath light maroon, 11-nerved, obtusely pointed and generally with the margins, when showing, thinly maroon. (From T. R. Bell's MS.)

Locality : N. Kanara : Yellapur (T. R. Bell).
Flowers and fruit : 15th June 1911.

8. *Nervilia Aragoana* Gaud. in Freyc. Voy. Bot. 422, t. 36; Fischer Fl. Madras pt. viii (1928) 1459.—*Pogonia flabelliformis* Lindl. in Wall. Cat. 7400; Gen. & Sp. Orchid. 415; in Journ. Linn. Soc. iii, 40; Hook. f. F.B.I. vi, 121; Duthie in Ann. Roy. Bot. Gard. ix, t. 125; Haines Bot. Bih. & Or. 1163.—*P. Nervilia* Blume Mus. Bot. i, 32.—*P. carinata* Wight Ic. t. 1720.—*Aptostellis flabelliformis* Ridley Fl. Malay Pen. iv (1924) 203.

Description : Tuber subglobose, white, about 2.5 cm. diam.; scape arising from the top of the tuber. Leaf ovate-acuminate or orbicular, cordate at base, 10-14 cm. diam., with 18-20 stronger nerves and as many or more finer intermediate ones; petiole 15-28 cm. long. Flowers green, 18 mm. long, spreading and drooping, up to 15. Sepals 15 mm. long, erect, connivent, lanceolate-linear, acute. Petals 12 mm. long, similar, but with faintly brown nerves. Lip very narrow, 12 mm. long, straight, neither saccate nor spurred, sometimes slightly gibbous, side lobes embracing the column, white, brown-veined; midlobe white, flat, projecting beyond the side lobes, ovate, but not constricted at base; palate hairy with 3 green veins. Column 8 mm. long. Ovary very short, 5 mm. long, winged.

Locality : Konkan : Neral (Herb. St. X. C. 26509!)—N. Kanara : Sampkhand, 1,600 ft. (Bell & Sedgwick 6966!).

Leafing : Aug. 1890 (Neral); Oct. 1919 (Sampkhand).

Distribution : Tropical Himalaya, from Garhwal 4,000-5,000 ft. eastwards, Malay Peninsula, Konkan, N. Kanara, Madras Pres.: Rampa, Pulney Hills; Travancore, Malaya, Siam.

9. *Nervilia carinata* Schlechter in Engl. Jahrb. xiv (1911) 404; Fischer Fl. Madras pt. viii (1928) 1459.—*Pogonia carinata* Lindl. Gen. & Sp. Orchid. (1840) 414; Dalz & Gibs. Bomb. Fl. 270; Hook. f. F. B. I. VI, 121; Prain Beng. Pl. 1026; Hook. f. in Ann. Roy. Bot. Gard. Calc. v, t. 94; Duthie in Ann. Roy. Bot. Gard. Calc. ix, t. 124; Cke. ii, 707.—*Epipactis carinata* Roxb. Fl. Ind. iii (1832) 454; Grah. Cat. 205.—*Pogonia flabelliformis* Woodr. in Journ. Bomb. Nat. Hist. Soc. xii (1899) 519 (*non* Lindl.).

Description : Cke. ii, 707. A better description in Duthie Fl. Upper Gang. Pl. iii, pt. ii (1920) 217.

Locality : Konkan (Stocks).—W. Ghats : Lonavla (Herb. St. X. C. 26508!). S. M. Country : Near Dharwar (Law).—N. Kanara : Kulgi, 1,500 ft. (T. R. Bell 6088!); without locality (T. R. Bell 4072!).

Flowers : May 1919 (Kulgi); August 1891 (Lonavla).

Distribution : Sub-Himalayan tracts of Rohilkhand and N. Oudh, Kumaon, Bengal, Burma, Bombay Pres., Mysore, Pulney Hills, Cochin.

30. EPIPOGUM Gmelin (not in Cke.).

Saprophytic, leafless, brownish, terrestrial herbs; roots tuberous or coralloid; stem erect, sheathed. Flowers laxly racemed. Sepals and petals subequal, narrow, free, erect or spreading. Lip sessile at the base of the column, broad, entire or 3-lobed, spurred, disk with rows of papillae. Column short; foot 0. Anther thick, dorsally 2-celled; pollinia 2, each with a long, filiform caudicle; gland small.

Species 5.—Old World.

Of this genus which was not known before to be represented in the Bombay Pres., only the following species has been found in N. Kanara.

1. *Epipogum nutans* Reichb. f. in Bonpland. (1857) 36; Lindl. in Journ. Linn. Soc. i, 177; Benth. Fl. Austral. vi, 308; Hook. f. F.B.I. vi, 124; Trim. Fl. Ceyl. iv (1893) 222; King & Pantl. in Ann. Roy. Bot. Gard. Calc. viii, t. 335; Fischer Fl. Madras pt. viii (1928) 1460; Brühl Orchid. Sikkim (1926) 148.—*E. roseum* Lindl. l. c.—*Galera nutans* Blume Bijdr. 415, t. 3; Mus. Bot. II, 187; Orchid. Archip. Ind. 139, t. 52 et 54E.—*G. rosea* Blume Mus. Bot. ii, 183; Orchid. Archip. Ind. 139.—*Podanthera pallida* Wight Ic. t. 1795.—*Ceratopsis rosea* Lindl. Gen. & Sp. Orchid. 383.—*Limodorum roseum* Don Prodr. Fl. Nep. 30.

Description : Tuber underground, 5 cm. and more in length; stem 10-40 cm. high; about 1 cm. thick at the base, gradually thinner upwards, with a few bracts and ending in a 5-20 cm. long raceme; flowers drooping, minus the

ovary about 12 mm. long, white; sepals and petals lanceolate-linear, connivent; lip oblong, concave, without side lobes but with a short blunt point, with a few reddish brown spots; spur half as long as the lip, somewhat bulbous; stem and ovary pale ochre-coloured.

Locality: N. Kanara: Yellapur, 1,800 ft. (Bell 4068!).

Flowers: June 1918.

Distribution: Tropical Himalaya, Nepal, Sikkim in hot valleys up to 4,000 ft., Khasia Mts. up to 6,900 ft., N. Kanara, Madras Pres.: Coorg, Bolampatti Hills at 4,500 ft., Anamalais, Pulneys at 5,000 ft., Wynaad, Ceylon, W. Africa, Java, Australia.

31. TROPIDIA Lindl. (not in Cke).

Terrestrial, glabrous, leafy herbs. Stem often branched, roots rigid. Leaves sessile, membranous, subplicate; petiole sheathing. Flowers small, in axillary and terminal sessile or peduncled spikes; bracts coriaceous, often imbricate, strongly nerved. Sepals connivent, lateral more or less connate, dorsal free. Petals as long, or shorter, broad or narrow. Lip superior, sessile at the base of the column, cymbiform or produced into an obtuse spur, undivided, acute or with a reflexed tip, disk with short or long intramarginal ridges on lamellae; column short or long; rostellum long, erect, at length 2-fid; stigma anticous; anther erect, acute or acuminate, cells contiguous; pollinia 2, clavate, 2-cleft, caudicle long or short, gland small. Capsule cylindrical-oblong.

Species 12.—Indo-Malayan, Polynesian.

1. *Tropidia Bellii* sp. nov. Blatter & McCann.

[*Pertinens ad sectionem Cnemidiae refert Tropidiam angulosam* Blume sed *distinguitur foliis basi rotundatis vel in vaginam decurrentibus, minime cordatis bracteis haud dimidiam florum longitudinem attingentibus, sepalis lateralibus subobtusis sub apice mucronatis, petalis quam sepalum dorsale latioribus, basalibus columnae appendicibus minimis obtusis.*]

Description: Terrestrial, glabrous. Stem about 30 cm. high. Leaves elliptic or broadly lanceolate acuminate, membranous, subplicate, 9-11-nerved, sheathing at base, up to 15 by 7 cm., base rounded or tapering into the sheath. Peduncle short, spike up to 5 cm. long, terminal, about 7-flowered. Bracts about 12 mm. long, linear-subulate, scarcely half as long as the flower. Sepals 3-5-nerved; lateral sepals connate, lanceolate, subobtusate, with a distinct mucro below the tip; dorsal sepal linear-lanceolate, free. Petals broader than dorsal sepal, ovate-lanceolate, 3-5-nerved; lip superior, sessile at base of column, produced into an obtuse spur, undivided, as long as the petals, obtuse, lateral nerves lamellate below middle; basal columnar appendages very small, obtuse. Anther erect, cells contiguous; pollinia 2, clavate; gland minute. Fruit not seen.

Locality: N. Kanara: Guddehalli, in evergreen forest, 1,500 ft., rainfall 150 in. (T. R. Bell 2992! type, Herb. St. X. C. 26562!).

Flowers: Sept. 1917.

32. SPIRANTHES Rich. (Cke. ii, 707).

Terrestrial herbs; roots fibrous or tuberous; stems erect, leafy, or the flowering leafless. Leaves usually narrow. Flowers small, in erect, secund, often twisted, many-flowered spikes. Sepals subequal, free, the lateral gibbous at the base, and inserted obliquely on the ovary, more or less cohering with the similar petals in an erect hood. Lip erect, sessile or clawed, entire or 3-lobed, base concave, disk bearing calli or lamellae. Column short, terete, base often decurrent on the ovary; foot 0. Anther erect, 2-celled; pollinia 2, 2-partite. pendulous.

Species 180-200.—Cosmopolitan with the exception of the arctic and subarctic zones; chiefly in tropical America.

Cooke has 1 species: *S. australis* Lindl which has to be changed into *S. sinensis* Ames.

Spiranthes sinensis Ames Orchid. II (1908) 53.—*S. australis* Lindl. in Bot. Reg. x (1824) sub t. 823; Dalz. & Gibs. Bomb. Fl. 270; Wight Ic. t. 1724 (media fig. et dextra tantum); King & Pantl. in Ann. Roy. Bot. Gard. Calc. viii (1898) t. 369; Hook. f. F.B.I. vi, 102; Cke. ii, 707.—*Neottia sinensis* Pers. Syn. ii, 511.

Description: Cke. ii, 707.

Distribution: Koakan, S.M. Country, N. Kanara, throughout India from the Punjab and W. Tibet to Upper Assam and southwards to Ceylon and Chittagong, up to 7,500 ft. in Sikkim and 7,000 ft. in the Nilgiris, Afghanistan, N. Asia, China, Java, Australia, N. Zealand.

33. ZEUXINE Lindl. (Cke. ii. 708).

Species about 35.—Tropical Africa and Asia.

Cooke mentions 2 species from the Bombay Pres.: *Z. sulcata* and *Z. longilabris*. We retain them but change the first name into *Z. strateumatica*.

- | | | | | |
|----------------------------|-----|-----|-----|------------------------------|
| 1. Leaves linear, sessile | ... | ... | ... | 1. <i>Z. strateumatica</i> . |
| 2. Leaves ovate, petiolate | ... | ... | ... | 2. <i>Z. longilabris</i> . |

1. *Zeuxine strateumatica* Schlechter in Fedde Repert. Beih i (1911) 77; Fischer Fl. Madras pt. viii (1928) 1456.—*Z. sulcata* Gen. & Sp. Orchid. (1840) 485; Griff. Ic. Pl. Asiat t. 349; Hook. f. F.B.I. VI, 106 (*excl. Z. membranacea* Lindl.); King Pantl. in Ann. Roy. Bot. Gard. Calc. viii (1893) 286, t. 381; Trim. Fl. Ceyl. iv, 215; Prain Beng. Pl. 1029; Duthie in Ann. Roy. Bot. Gard. Calc. ix, pt. 2, 168; Fl. Upp. Gang. Pl. iii, pt. ii, 219; Cke. II, 708; Haines Bot. Bilh. & Or. 1161; Brühl Orchid. Sikkim 171.—*Z. bracteata* Wight Ic. v, pt. 1 (1852) 16, t. 1724 *bis*.—*Z. brevifolia* Wight Ic. 1. c. t. 1725.—*Z. robusta* Wight Ic. t. 1726.—*Pterygodium sulcatum* Roxb. Fl. Ind. iii (1832) 452.

Description: Cke. ii, 708.

Locality: *Sind* (Stocks 411).—*Gujarat*: Swampy ground on bank of Anbika Nala, Waghai Dangs (T. R. Bell 5386 !).—*Deccan*: Pashan near Poona (Gammie !); Deccan hills (Herb. Econ. Bot. Poona !).—*S.M. Country*: Near the bank of a stream, Gokak Falls, Belgaum Dist. (Sedgwick 5449 !); Dharwar (Law).—*N. Kanara* (Law).

Distribution: Abundant in grassy places throughout the greater portion of India, ascending to about 5,000 ft. on the outer Himalayan ranges, Malay Peninsula, Afghanistan, Ceylon, China, Japan, Java, Philippines.

2. *Zeuxine longilabris* Benth. in Benth. & Hook. f. Gen. Pl. iii (1883) 600; Hook. f. F.B.I. vi, 107; Trim. Fl. Ceyl. IV, 216; Prain Beng. Pl. 1029; Cke. ii, 709; Fischer Fl. Madras pt. viii (1928) 1456.—*Monochilus longilabre* Lindl. Gen. & Sp. Orchid. (1810) 487; Dalz. & Gibs. Bombay Fl. 271.—*M. affine* Wight Ic. v, pt. 1 (1852) 16, t. 1728.

Description: Cke. ii, 709.—Flowers white or olive with lip white and column orange.—The specimen from N. Kanara mentioned below was found epiphytic.

Locality: *Konkan* (Law, Stocks).—*N. Kanara*: Anmod, on bole of big tree in dense jungle, 2,000 ft. (Sedgwick 3371 !); Anmod (Talbot 1644 !); Pala (Talbot 3530 !).

Distribution: Bengal, Assam, Konkan, N. Kanara, W. Ghats of Madras Pres. from the low country to 4,000 ft., High Wavy Mts., Ceylon.

34. CHEIROSTYLIS GRIFF. (Cke. ii. 709).

Species 15.—Tropical Africa, Indo-Malaya, Australia.

Up to now 1 species was known from the Presidency; we add a new one.

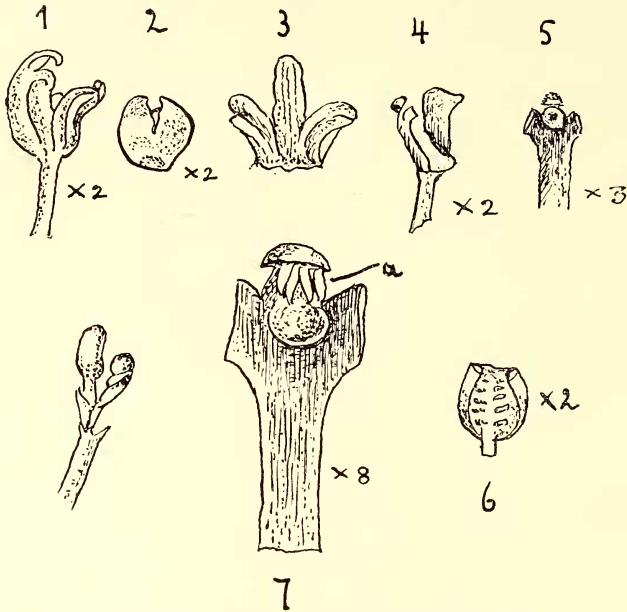
- | | | | | |
|---|-----|-----|-----|---------------------------|
| 1. Lip with a spreading suborbicular deeply 2-lobed limb, lobes sub 5-fid | ... | ... | ... | 1. <i>C. flabellata</i> . |
| 2. Lip with 2 large rounded somewhat incurved side lobes; midlobe shorter | ... | ... | ... | 2. <i>C. kanarensis</i> . |

1. *Cheirostylis flabellata* Wight Ic. v, pt. 1 (1852) 16; Dalz. & Gibs. Bomb Fl. 271; Hook. f. F.B.I. vi, 105; Trim. Fl. Ceyl. iv, 211; Cke. ii, 709; Fisher Fl. Madras pt. viii (1928) 1454.—*Monochilus flabellatum* Wight Ic. t. 1727.

Description: Cke. ii, 709.—The species of *Cheirostylis* are usually terrestrial. T. R. Bell has found an epiphytic specimen at Amboli.

Locality: *W. Ghats*: Tinai Ghat (Gammie 15816 !); Amboli Ghat (T. R. Bell !).—*S. M. Country*: Chorla Ghat (Dalzell & Gibson).—*N. Kanara*: Kumpta-Sirsi road (Woodrow); Guddehalli (T. R. Bell 7842 !).

Distribution: Bhutan Himalaya, Tenasserim, Bombay Pres., Nilgiris and Pulneys at 6,000 ft. and upwards, Ceylon.



Cheirostylis kanarensis Blatter & McCann. *sp. nov.*

1. Flower; 2. Sepals subtending the lip; 3. Dorsal sepal and adnate petals; 4. Lip and Column; 5. Column; 6. Lip. 7a Attachment of pollinia hanging from underside of the raised caps, quite free.

2. *Cheirostylis kanarensis sp. nov.* Blatter & McCann.

Orchidacea similis Ch. flabellatae a qua differt scapo glabro, sepalis laterlibus fere semicircularibus, labio 3-lobato lobis lateralibus magnis.)

Description: A delicate saprophytic plant, only 5-7.5 cm. in height when flowering, extremely fragile, reaching 30 cm. in fruit. Root an irregular-shaped long tuber, lying horizontally about 7 cm. below the surface, 25 by 7 mm. to 7 by 3 mm., sometimes 1, sometimes more tubers to one plant; rootlets given off just below attachment of scape. Bract scarious. Flowers usually 3, racemose, at a right angle to the scape, 10 mm. long, 6 mm. wide between tips of petals when spread out, pure white, light brownish in bud. Pedicels up to 6 mm. long, often, reaching 15 cm. in fruit. Petals and sepals united into an involucre for column and lip, the division between the strongly hooded dorsal part, composed of dorsal sepal and petals and the lower part subtending the lip composed of the 2 sepals, is deepest reaching $\frac{2}{3}$ of the ovary down, the division between the dorsal sepal and petals reaches $\frac{1}{2}$ way down, that between the sepals about $\frac{1}{2}$ of the way; all the divisions are acute. Dorsal sepal linear-oblong and minutely bifid, longest 9 by 2.5 mm.; petals 5 by 2 mm., similar but slightly falcate, entire. Lateral sepals 5 mm. long, nearly semicircular with the junction along the straight edges, edges slightly crenulate, all 3-veined, concave, the veins very prominent on the back, slightly saccate below like *Propax* to allow of the lip-hinges being curved. Lip 5 by 4 mm., with 2 large rounded side lobes, midlobe shorter, shortly rounded; side lobes somewhat incurved. Lip attached to a prolongation of the column by a very delicate curved hinge which allows it to assume the erect position it occupies facing and embracing the column, parallel to the dorsal sepal, with a central yellow, broad, furry ridge which is transversely very irregularly and deeply impressed, not pinnately divided, leaving central axis entire. The column is white,



Del. C. McCann after T. R. Bell.

Cheirostylis kanarensis Blatter and McCann, *sp. nov.*

slightly curved forwards and has 2 large square expansions (appendages, nearly parallel to each other, occupying the upper $\frac{1}{3}$ or more, one on each side of the round stigmatic depression; the dorsal part of the column produced very slightly beyond the level of those appendages into a rounded semicircular plate (rostellum) on the apex of which is fixed the cap by its edge, the cap being otherwise free, overhanging the stigmatic depression. To the underside of this cap are hung the 2 bipartite pollinia looking like sausages in a row, all in a line between the appendages of the column. Pollinia greyish, powdery looking, long-ovoid in shape. Ovary slightly twisted at base, 7 mm. long. Fruit large for the flower, being 20 by 4 mm., ovoid in shape but with 1 flattened face, the convex part of circumference having 2 of the 6 longitudinal somewhat predominant ridges (triangular in section), the flattened portion only 1; the apex bears the remains of the withered then cylindrical and brown flower, supported on a basal ring forming the truncated end of fruit. The capsule opens along the apex of the ridges and finally assumes, when completely open, a more or less globose shape, remaining joined at apex and base. The colour of the whole plant in fruit is light straw-yellow except the bracts and flowers which are dark brown. (After detailed sketches and MS. notes of T. R. Bell.)

Note: The tuber or tubers lie about 7 cm. underground in black soil under the shade of trees in jungle generally on the edge of a clearing. The rootlets arise just below the point of attachment of the stem and creep along close to the surface of the ground or on it under decaying leaves. The flowers are fertilized by a small very active hymenopter. The buds are very close together, nearly sessile, but as they get larger, the pedicels gradually lengthen until in flower they reach quite 6 mm. in length. This lengthening of the pedicels continues after flowering and the thickness also increases, until the fruit is ripe, sometimes reaching 15 cm. in length by $1\frac{1}{2}$ times the thickness of the scape, pedicels of different lengths from 5-15 cm. being common on the same plant. The ordinary number of flowers to one plant is 3, but there may be as many as 5 buds, never more than 1 flower developing on any one day; the bloom lasts only a day, expanding in the morning and every 24 hours a fresh flower is produced.

Locality: N. Kanara: Tatwal (T. R. Bell).

Flowers: June 1912.

35. PERISTYLUS Blume. (Cke. ii. 710).

Species about 80.—Warm regions of Old World.

Cooke has 5 species. We retain all and add 1 species, *P. stenostachyus*, not known from the Presidency before, and add a new species: *P. xanthochlorus*.

A. Leaves scattered or imbricate on the stem, not clustered

I. Spur as long as the sepals or longer

- | | |
|--|------------------------------|
| 1. Stem stout; Leaves many-nerved; spike dense-flowered; spur curved at base ... | 1. <i>P. xanthochlorus</i> . |
| 2. Stem slender; leaves 5-7-nerved; spike lax-flowered; spur straight ... | 2. <i>P. stenostachyus</i> . |

II. Spur much shorter than the sepals, globose ...

3. *P. spiralis*.

B. Leaves clustered about the middle of the stem

I. Lip longer than the sepals, obtusely 3-lobed, lobes linear-oblong ...

4. *P. Stocksii*.

II. Lip shorter than the sepals; petals white

5. *P. plantagineus*.

III. Lip as long as the sepals; petals yellow or yellowish green

- | | |
|--|-----------------------------|
| 1. Lateral sepals mucronate at the back below apex; spikes dense, 10-30 cm. long ... | 6. <i>P. goodycroides</i> . |
| 3. Lateral sepals not mucronate at the back below apex; spikes lax, 5-7.5 cm. long ... | 7. <i>P. Lawii</i> . |

1. *Peristylus xanthochlorus* sp. nov. Blatter & McCann.

Orchidacea similis Peristylu Richardiano Wight necnon *Peristylu stenostachyo* Krzl. *A priore differt scapo minore, foliis apiculatis et multinerviis, bracteis ovato-longe-acuminatis vel ovato-oblongis-acuminatis sepalis lateralibus linearibus falcatis subacutis vel obtusis, petalis ovato-oblongis aliquantulum*

obliquis, labii lobis lateralibus linearibus, in statu sicco tota planta brunnea minime nigrescente. A posteriore autem distinguitur scapo crasso, foliis multinerviis, bracteis multo largioribus floribus maioribus viridi-flavis nunquam albidis, spica cylindrica densanulli—(usque 40-) flora, labii lobis lateralibus linearibus obtusis sursum curvatis et retrorsum, calcare ad basin curvato in tertia parte superiore paulum incrassato et ad apicem angustiore.

Description: Tuber one. Stem 12-32 cm. high, stout, stiff, leafy, pale green. Leaves few (4-5), scattered on the stem, pale green or yellowish green, lanceolate or oblong-lanceolate, acute, apiculate, sheathing at base, many-nerved, recurved in the upper part, up to 6 by 2 cm., subpubescent, succeeded by 1 or 2 bract-like leaves. Flowers greenish yellow, many (up to 40), subsecund or scattered, never secund, forming a dense terminal cylindrical spike 5-16 cm. long, usually as long as the flowerless part of the scape. Bracts not imbricating, the lower up to 15 by 4-5 mm., shorter or longer than the flowers, ovate-long-acuminate, or ovate-oblong-acuminate, cucullate, upper 7 by 3 mm., midrib prominent on back. Lateral sepals linear, falcate, subacute or obtuse, pale green, 5 by 1.5 mm., obliquely ascending. Dorsal sepal pale green, oblong or narrowly ovate-oblong, obtuse, 5 by 2 mm., 3-nerved. Petals greenish yellow, membranous, ovate-oblong, slightly oblique, obtuse, 5 by 2 mm. Lip fleshy, rigid, 5 mm. long. 10 mm. broad, 3-lobed; basal claw very narrow and short with 2 rounded short auricles; side lobes 5 by 0.75 mm., linear, obtuse, spreading, curved upwards and backwards; midlobe 2.5-3 mm. long, narrowly triangular, obtuse, 1 mm. broad at base, narrower at apex. Ovary sessile, about 8 mm. long. Spur 6-7 mm. long, curved near the base, then appressed to ovary, slightly thickened in the upper third, getting thinner again at apex and obtuse, greenish white. Anther-tubes 0. Stigmatic processes large, elongating, parallel. Pollinia granular; caudicle very slender, as long as the pollinium. Gland very small. Rostellum short. Fruit 10 by 4 mm., sessile, flattened towards the axis, narrowly conical, rounded at base, 6-ridged, slightly twisted.

Locality: *W. Ghats:* Panchgani, 1st Tableland, in low grass (Blatter & Halberg B1686! type, Blatter P81!, Sedgwick 7565! 7596 bis! 7930!); Mahabaleshwar (Sedgwick 7622 bis! 7642!).

The Panchgani specimens are smaller throughout than those from Mahabaleshwar. Is it due to the much greater rainfall of the latter place, or to the scanty soil on the Tableland of Panchgani?

Flowers: September 1925 (Panchgani); October 1920 (Panchgani and Mahabaleshwar).

2. *Peristylus stenostachyus* Kraenzlin Orchid. Gen. & Sp. i, 502; Fischer Fl. Madras pt. viii (1928) 1474.—*Habenaria stenostachya* Benth. Fl. Hongk. 362; Hook. f. F.B.I. vi, 15f.—*H. peristylodes* Wight Ic. t. 1702.—*Platanthera stenostachya* Lindl. in Hook. Journ. Bot. vii (1855) 37.

Description: Plant 10-50 cm. high, usually slender, with many small sheaths above the leaves: Leaves confined to the lower half or two-thirds of the stem, lanceolate or linear-lanceolate, obtuse, acute or acuminate, 2.5-10 cm. long, 3-17 mm. broad. Spike narrow, 2.5-15 cm. long, lax-flowered; flowers small, about 8 mm. diam., erect, greenish yellow or white; bracts 6-8 mm., broadly ovate-lanceolate, finely acuminate. Sepals 4 mm. long, subequal, concave, lateral linear, obtuse, suberect, at length spreading, nerve very thick, produced into a point under the apex of the sepal. Petals triangular-ovate or oblong, obtuse. Lip excavate at base, side lobes subulate, as long as or slightly longer than the sepals, spreading, longer than the broader, obtuse midlobe. Spur slender, straight, not thickened below. Anther minute, cells parallel, tubes 0. Pollinia short, grains large, caudicle and gland obscure. Stigmatic processes clavate; rostellum erect, truncate, dentate, plicate, concealing the glands of the pollinia. Ovary 6 mm. long.

Locality: *W. Ghats:* Castle Rock, on open rocky ground on the hill side 1,600 ft. (Sedgwick 2779!).—*N. Kanara:* In forests (T. R. Bell 5409!); Mundgod Road, rice fields (Talbot!); Tinai (Talbot 2508!); Yellapur, in abandoned rice fields (Talbot!).

Flowers: August 1917 (Castle Rock); August 1831 (Yellapur); September 1831 (Mundgod Rd.); September 1891 (Tinai).

Distribution: Sikkim Himalaya, Knasia Hills, Tenasserim, N. Kanara, Bababudan and Pulney Hills, High Wavy Mountains.

3. *Peristylus spiralis* A. Rich. in Ann. Sc. Nat. sér. 2, xv, 69, t. 2, B; Wight Ic. t. 1696; Kraenzlin Orchid. Gen. & Sp. i (1898) 510; Cke. ii, 711; Fischer Fl. Madras pt. viii (1928) 1474.—*Habenaria torta* Hook. f. F.B.I. vi. (1890) 159; Trim. Fl. Ceyl. iv, 234.

Description: Cke. l. c.

Locality: Bombay Pres. (Dalzell 14! in Herb. Calc.).—*Konkan* (Law, Stocks).—*W. Ghats*: Tinai Ghat (Talbot 2508!).

Distribution: Bombay Pres., Bababudan and Nilgiri Hills, 5,000-7,500 ft., Travancore, Ceylon.

4. *Peristylus Stocksii* Kraenzlin Orchid. Gen. & Sp. i (1898) 513; Cke. ii, 710; Fischer Fl. Madras pt. viii (1928) 1475.—*Habenaria Stocksii* Hook. f. F.B.I. vi. (1890) 158.

Description: Cke. l. c.

Locality: *Konkan*: Mulland, in dense forest (McCann!); Dronaghiri (Stocks); Neral (Bhiva!); Ambenali (Blatter & McCann!).—*W. Ghats*: Fitzgerald Ghat, 2 miles from Mahableshwar (McCann 3942!).—*S. M. Country*: Ramghat (Ritchie 1398).—*N. Kanara*: Sirsi, in evergreen forest (Sedgwick & Bell 7004!).

Flowers: July to August (ex Cooke).

Flowers and Fruit: October 1919 and 1930.

Distribution: Bombay Pres., Mysore.

5. *Peristylus plantagineus* Lindl. Gen. & Sp. Orchid. (1835) 300; Wight Ic. t. 921; Kraenzlin Orchid. Gen. & Sp. i (1898) 516; Cke. ii, 711; Fischer Fl. Madras pt. viii. (1928) 1475.—*Peristylus elathus* Dalz. & Gibs. in Kew Journ. Bot. iii (1851) 344; Bomb. Fl. 270.—*Habenaria Wightii* Trim. Cat. Ceyl. Pl. (1885) 91; Hook. f. F.B.I. vi. (1890) 162; Trim. Fl. Ceyl. iv, 232.

Description: Cke. ii, 711.

Locality: *Konkan*: (Nimmo!); Malvan (Dalzell).—*W. Ghats*: Near Lonavla (Kanitkar! Herb. Econ. Bot. Poona); Ramghat (Ritchie 1396); Londa (Spoonier!).—*S. M. Country*: Devikot, Dharwar Dist., deciduous forests, 2,000 ft. (Sedgwick 3007!).—*N. Kanara*: Karwar (Talbot!); maritime scrubs on rocks by the sea (Sedgwick & Bell 6783!); Guddehalli (Talbot 443!); on edges of open spaces in jungle (T. R. Bell 7869 bis!), in forests (T. R. Bell 5110!); forests of Nayayali, 2,000 ft., rainfall 80 in. (Sedgwick 2945!); Yellapur, common in places (Talbot 551!).

Flowers: August 1881 (Yellapur); August 1889 (Karwar); August 1883 and 1920 (Guddehalli); September 1883 (Yellapur); September 1919 (Dharwar Dist.); October 1882 (Yellapur).

Fruit: September 1917 (Nayayali)! October 1919 (Karwar).

Distribution: Central Provinces (Pachmai); Bombay Pres., Madras Pres.; Rampa Hills, Anamalais, 2,000-2,300 ft., Travancore, Malabar, Ceylon.

6. *Peristylus goodyeroides* Lindl. Gen. & Sp. Orchid. (1835) 299; Dalz. & Gibs. Bomb. Fl. 270; Royle Ill. t. 87, f. 2; Cke. II, 712; Fischer Fl. Madras pt. viii (1928) 1475.—*Habenaria goodyeroides* Don Prodr. 25; Hook f. F.B.I. vi, 161; King & Pantl. Ann. Roy. Bot. Gard. viii, t. 430.

Description: Cke. l. c.

Locality: *Konkan* (Nimmo, Dalzell).—*W. Ghats*: Castle Rock, 1,600 ft. (Sedgwick 2806!).—*N. Kanara*: Devimane Ghat (Sedgwick & Bell 6942!).

In bud: August 1917 (Castle Rock).

Distribution: Nepal, Sikkim, Khasia Hills, Naga Hills, Konkan, N. Kanara, W. Ghats of Bombay and Madras Pres., 2,000-4,000 ft.

7. *Peristylus Lawii* Wight Ic. v, pt. 1 (1852) 12, t. 1695; Dalz. & Gibs. Bomb. Fl. 270; Kraenzl. Orchid. Gen. & Sp. i (1898) 510; Cke. II, 712.—*Habenaria Lawii* Hook. f. F.B.I. vi (1890) 162; Prain Beng. Pl. 1032; Duthie in Ann. Roy. Bot. Gard. Calc. ix, pt. 2, 192, t. 143; Fl. Upp. Gang. Pl. iii, pt. ii. (1920) 227.

Description: Cke. ii, 712.

Locality: *Konkan*: (Dalzell, Law); Neral (Bhiva!).—*W. Ghats* (Gibson! Herb. Calc.).—*S. M. Country*: Belgaum (Law); near Dharwar (Law ex Stocks 73).

Distribution: W. Himalaya, in Garhwal, Bengal, Bihar, C. Provinces, in the Chanda Dist., Bombay Pres.

36. PLATANThERA Rich. (Cke. ii. 712).

Species about 80.—Throughout the N. temperate regions and in the tropics of Asia and Africa, chiefly in the mountains.

1. *Platanthera Susannæ* Lindl. Gen. & Sp. Orchid. (1835) 295; Dalz. & Gibs. Bomb. Fl. 269; Wight Ic. t. 920; Kraenzl. Orchid. Gen. & Sp. i (1898) 601; Cke. ii, 713; Fischer Fl. Madras pt. viii (1928) 1475.—*Habenaria Susannæ* R. Br. Prodr. (1810) 312; Hook. f. F.B.I. vi (1890) 137; Prain Beng. Pl. 1030; Haines Bot. Bih. & Or. 1155; Duthie in Ann. Roy. Bot. Gard. ix, pt. 2, 178, 128.—*Orchis Susannæ* Linn. Sp. Pl. (1753) 939.—*Orchis gigantea* Don Prodr. 24.—*Platanthera robusta* Lindl. in Wall. Cat. no. 7036.

Description: Cke 1. c.

Locality: *Konkan*: Matheran (Cooke!);—*W. Ghats*: Khandala (Stocks 7, Blatter!, Hallberg!, Cooke!); Panchgani, above Khingar (McCann!); Mahabaleshwar (Cooke, Blatter & McCann!, McCann!); Castle Rock (Sedgwick 4482!, Gammie 15784!).—*S. M. Country*: Belgaum (Ritchie 1395).—*N. Kanara*: Yellapur (Talbot 732; Herb. Calc., T. R. Bell 3121!).

Distribution: Outer Himalayan range in Garhwal and Kumaon up to 6,000 ft., Sikkim, Khasia, Naga and Manipur Hills, Burma, Chota Nagpur, Konkan, S. M. Country, N. Kanara, W. Ghats of Bombay and Madras Pres., 1,600-7,500 ft., China, Malay Archipelago.

(To be continued.)